

WHAT IS CLAIMED IS:

1. A head position control apparatus that controls a position of a head that performs read and write of information with respect to a medium rotated and driven by a spindle, the spindle including a
5 hydrodynamic bearing, comprising:
a judgment unit that judges whether gyroscopic moment of the spindle is out of a predetermined range; and
a control unit that controls the position of the head to compensate for the inclination of the spindle upon a judgment by the
10 judgment unit that the gyroscopic moment is out of the predetermined range.
2. The head position control apparatus according to claim 1, further comprising a detecting unit that detects an inclination of the
15 spindle, and if the inclination detected exceeds a predetermined threshold the judgment unit judges that the gyroscopic moment is out of the predetermined range.
3. The head position control apparatus according to claim 1,
20 further comprising a detecting unit that detects a change in the revolution speed of the spindle, and if the change in the revolution speed detected exceeds a predetermined threshold the judgment unit judges that the gyroscopic moment is out of the predetermined range.

4. The head position control apparatus according to claim 1,
further comprising a detecting unit that detects an amplitude of
respective orders in a repeatable runout of the spindle, and if an
amplitude of a specific order, which affects read and write of information,
5 exceeds a predetermined threshold, the judgment unit judges that the
gyroscopic moment is out of the predetermined range.

5. The head position control apparatus according to claim 1,
further comprising a detecting unit that detects whether it is possible to
10 read and write information from or into the medium, and if a state that
read and write of information from or into the medium occurs
repetitively in a predetermined cycle, the judgment unit judges that the
gyroscopic moment is out of the predetermined range.

15 6. The head position control apparatus according to claim 1,
further comprising a detecting unit that detects whether it is possible to
read and write information from or into the medium, and if a state that
read and write of information from or into the medium continue for a
predetermined period, the judgment unit judges that the gyroscopic
20 moment is out of the predetermined range.

7. The head position control apparatus according to claim 1,
wherein the control unit calculates a phase correction quantity and an
amplitude correction quantity with respect to a basic repeatable runout
25 of the spindle, and controls the position of the head to compensate for

the inclination of the spindle based on the phase correction quantity and the amplitude correction quantity, wherein

the basic repeatable runout of the spindle is obtained by a predetermined oscillation test performed in advance.

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8. The head position control apparatus according to claim 1, wherein the control unit controls the position of the head by executing a repeat control.

10 9. The head position control apparatus according to claim 1, wherein the control unit controls the position of the head by using a compression filter.

10. The head position control apparatus according to claim 7,
15 wherein the control unit controls the position of the head to compensate for the inclination of the spindle resulting from the repeatable runout of a specific order, which affects read and write of information, of the respective orders in the repeatable runout of the spindle.

20 11. The head position control apparatus according to claim 8, wherein the control unit controls the position of the head to compensate for the inclination of the spindle resulting from the repeatable runout of a specific order, which affects read and write of information, of the respective orders in the repeatable runout of the spindle.

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12. The head position control apparatus according to claim 9,
wherein the control unit controls the position of the head to compensate
for the inclination of the spindle resulting from the repeatable runout of
a specific order, which affects read and write of information, of the
5 respective orders in the repeatable runout of the spindle.

13. The head position control apparatus according to claim 7,
wherein the control unit controls the position of the head to compensate
for the inclination of the spindle resulting from the repeatable runout of
10 a specific order, which affects read and write of information, and whose
amplitude exceeds the predetermined threshold, of the respective
orders in the repeatable runout of the spindle.

14. The head position control apparatus according to claim 8,
15 wherein the control unit controls the position of the head to compensate
for the inclination of the spindle resulting from the repeatable runout of
a specific order, which affects read and write of information, and whose
amplitude exceeds the predetermined threshold, of the respective
orders in the repeatable runout of the spindle.

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15. The head position control apparatus according to claim 9,
wherein the control unit controls the position of the head to compensate
for the inclination of the spindle resulting from the repeatable runout of
a specific order, which affects read and write of information, and whose
25 amplitude exceeds the predetermined threshold, of the respective

orders in the repeatable runout of the spindle.

16. A method of controlling a position of a head that performs read and write of information with respect to a medium rotated and driven by a spindle, the spindle including a hydrodynamic bearing, comprising:
- 5 judging whether gyroscopic moment of the spindle is out of a predetermined range; and
- controlling the position of the head to compensate for the inclination of the spindle upon a judgment at the judging that the
- 10 gyroscopic moment is out of the predetermined range.
17. The head position control method according to claim 16, further comprising detecting an inclination of the spindle, and if the inclination detected exceeds a predetermined threshold, it is judged at the judging
- 15 that the gyroscopic moment is out of the predetermined range.
18. The head position control method according to claim 16, further comprising detecting a change in the revolution speed of the spindle, and if the change in the revolution speed detected exceeds a
- 20 predetermined threshold, it is judged at the judging that the gyroscopic moment is out of the predetermined range.
19. The head position control method according to claim 16, further comprising detecting an amplitude of respective orders in the
- 25 repeatable runout of the spindle, and if the amplitude of a specific order,

which affects read and write of information, exceeds a predetermined threshold, it is judged at the judging that the gyroscopic moment is out of the predetermined range.

5 20. The head position control method according to claim 16, further comprising detecting whether it is possible to read and write information from or into the medium, and if a state that read and write of information from or into the medium occurs repetitively in a predetermined cycle, it is judged at the judging that the gyroscopic moment is out of the
10 predetermined range.

21. The head position control method according to claim 16, further comprising detecting whether it is possible to read and write information from or into the medium, and if a state that read and write of information
15 from or into the medium continue for a predetermined period, it is judged at the judging that the gyroscopic moment is out of the predetermined range.

22. The head position control method according claim 16, further
20 comprising:

calculating the phase correction quantity and the amplitude correction quantity with respect to the basic repeatable runout of the spindle, wherein the basic repeatable runout of the spindle is obtained by a predetermined oscillation test performed in advance; and
25 controlling the position of the head to compensate for the

inclination of the spindle based on the phase correction quantity and the amplitude correction quantity.

23. The head position control method according to claim 16,
5 wherein the controlling includes controlling the position of the head by executing repeat control.

24. The head position control method according to claim 16,
wherein the controlling includes controlling the position of the head by
10 using a compression filter.

25. The head position control method according to claim 22,
wherein the controlling includes controlling the position of the head to
compensate for the inclination of the spindle resulting from the
15 repeatable runout of a specific order, which affects read and write of
information, of the respective orders in the repeatable runout of the
spindle.

26. The head position control method according to claim 23,
20 wherein the controlling includes controlling the position of the head to
compensate for the inclination of the spindle resulting from the
repeatable runout of a specific order, which affects read and write of
information, of the respective orders in the repeatable runout of the
spindle.

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27. The head position control method according to claim 24,
wherein the controlling includes controlling the position of the head to
compensate for the inclination of the spindle resulting from the
repeatable runout of a specific order, which affects read and write of
5 information, of the respective orders in the repeatable runout of the
spindle.

28. The head position control method according to claim 22,
wherein the controlling includes controlling the position of the head to
10 compensate for the inclination of the spindle resulting from the
repeatable runout of a specific order, which affects read and write of
information, and whose amplitude exceeds the predetermined threshold,
of the respective orders in the repeatable runout of the spindle.

15 29. The head position control method according to claim 23,
wherein the controlling includes controlling the position of the head to
compensate for the inclination of the spindle resulting from the
repeatable runout of a specific order, which affects read and write of
information, and whose amplitude exceeds the predetermined threshold,
20 of the respective orders in the repeatable runout of the spindle.

30. The head position control method according to claim 24,
wherein the controlling includes controlling the position of the head to
compensate for the inclination of the spindle resulting from the
25 repeatable runout of a specific order, which affects read and write of

information, and whose amplitude exceeds the predetermined threshold,
of the respective orders in the repeatable runout of the spindle.

31. A computer program for realizing on a computer controlling a
5 position of a head that performs read and write of information with
respect to a medium rotated and driven by a spindle, the spindle
including a hydrodynamic bearing, comprising:

judging whether gyroscopic moment of the spindle is out of a
predetermined range; and

10 controlling the position of the head to compensate for the
inclination of the spindle upon a judgment at the judging that the
gyroscopic moment is out of the predetermined range.